

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/12349

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01J5/04 C21C5/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01J C21C C10J C21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 134 295 A (VOEST ALPINE IND INC) 19 September 2001 (2001-09-19) abstract paragraphs '0015!-'0024!, '0028! claim 2 figures 1,2	3-5, 7-9
X	US 4 619 533 A (PEACEY JOHN G ET AL) 28 October 1986 (1986-10-28) column 2, line 32 - column 3, line 15 column 5, line 34 - line 41 figure 1 --- -/-	7-9

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

6 May 2004

Date of mailing of the international search report

04.06.2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Haller, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/12349

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 010, no. 036 (C-328), 13 February 1986 (1986-02-13) & JP 60 187608 A (KAWASAKI SEITETSU KK), 25 September 1985 (1985-09-25) abstract figure 1 ----	3-5,7-9
X	LU 90 610 A (SIDMAR NV ;WURTH PAUL SA (LU)) 11 January 2002 (2002-01-11) page 1, line 24 -page 2, line 2 page 3, line 18 -page 5, line 9 page 7, line 11 - line 31 figures 1,2 ----	7-9
A	CARLHOFF C ET AL: "LASERINDUZIERTE EMISSIONSSPEKTROSKOPIE FUER DIE DIREKTANALYSE VON FLUESSIGEM STAHL IM KONVERTER" LASER UND OPTOELEKTRONIK, FACHVERLAG GMBH. STUTTGART, DE, vol. 23, no. 4, 1 August 1991 (1991-08-01), pages 50-52, XP000216633 ISSN: 0722-9003 page 51, column 1, paragraphs 2,3 ----	8
A	US 4 416 443 A (HELFI ALFRED F ET AL) 22 November 1983 (1983-11-22) column 1, line 66 -column 2, line 43 column 3, line 16 - line 32 figure 3 ----	1,2,7-9
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 02, 29 February 2000 (2000-02-29) & JP 11 326061 A (SUMITOMO METAL IND LTD), 26 November 1999 (1999-11-26) abstract figure 1 ----	6
A	US 5 315 341 A (HIBBARD ROBERT H) 24 May 1994 (1994-05-24) abstract column 3, line 4 -column 4, line 68 column 5, line 58 -column 6, line 12 figures 4,5 ----	6
A	US 5 283 608 A (GOO BONJEONG ET AL) 1 February 1994 (1994-02-01) abstract column 2, line 9 - line 26 column 3, line 26 - line 43 column 5, line 34 - line 61 figure 1 ----- -/--	6

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/12349

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 0 645 601 A (LORRAINE LAMINAGE) 29 March 1995 (1995-03-29) abstract</p> <p>-----</p>	6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/12349

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-2, 7-9

Process and apparatus for keeping a tuyere passing through a metallurgical vessel free of skull by intermittently passing an oxygen-containing gas through the tuyere, wherein the moment for starting to pass said gas is determined on the basis of threshold data derived by a dual wavelength pyrometer from a spot in the interior of the melt.

2. Claims: 3-5

Use of a video camera for adjusting the optical axis of an instrument sensing radiation through a tuyere.

3. Claim : 6

Method for measuring the length of a tuyere passing through a metallurgical vessel by means of an autofocus video camera.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/12349

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1134295	A	19-09-2001	EP 1134295 A1	19-09-2001
US 4619533	A	28-10-1986	CA 1218866 A1	10-03-1987
			AU 568720 B2	07-01-1988
			AU 3851485 A	31-10-1985
			DE 3569612 D1	24-05-1989
			EP 0160359 A2	06-11-1985
			FI 851492 A ,B,	25-10-1985
			JP 60231126 A	16-11-1985
			ZA 8501439 A	30-10-1985
JP 60187608	A	25-09-1985	NONE	
LU 90610	A	11-01-2002	LU 90610 A1	11-01-2002
US 4416443	A	22-11-1983	FR 2517699 A1	10-06-1983
			DE 3206543 A1	16-06-1983
			JP 58104109 A	21-06-1983
JP 11326061	A	26-11-1999	NONE	
US 5315341	A	24-05-1994	NONE	
US 5283608	A	01-02-1994	NONE	
EP 0645601	A	29-03-1995	FR 2710740 A1	07-04-1995
			CA 2133025 A1	30-03-1995
			EP 0645601 A1	29-03-1995
			JP 7174524 A	14-07-1995